Catalogue of American Amphibians and Reptiles.

WARD, JOSEPH P. 1978. *Terrapene ornata*.

Terrapene ornata (Agassiz)
Ornate box turtle

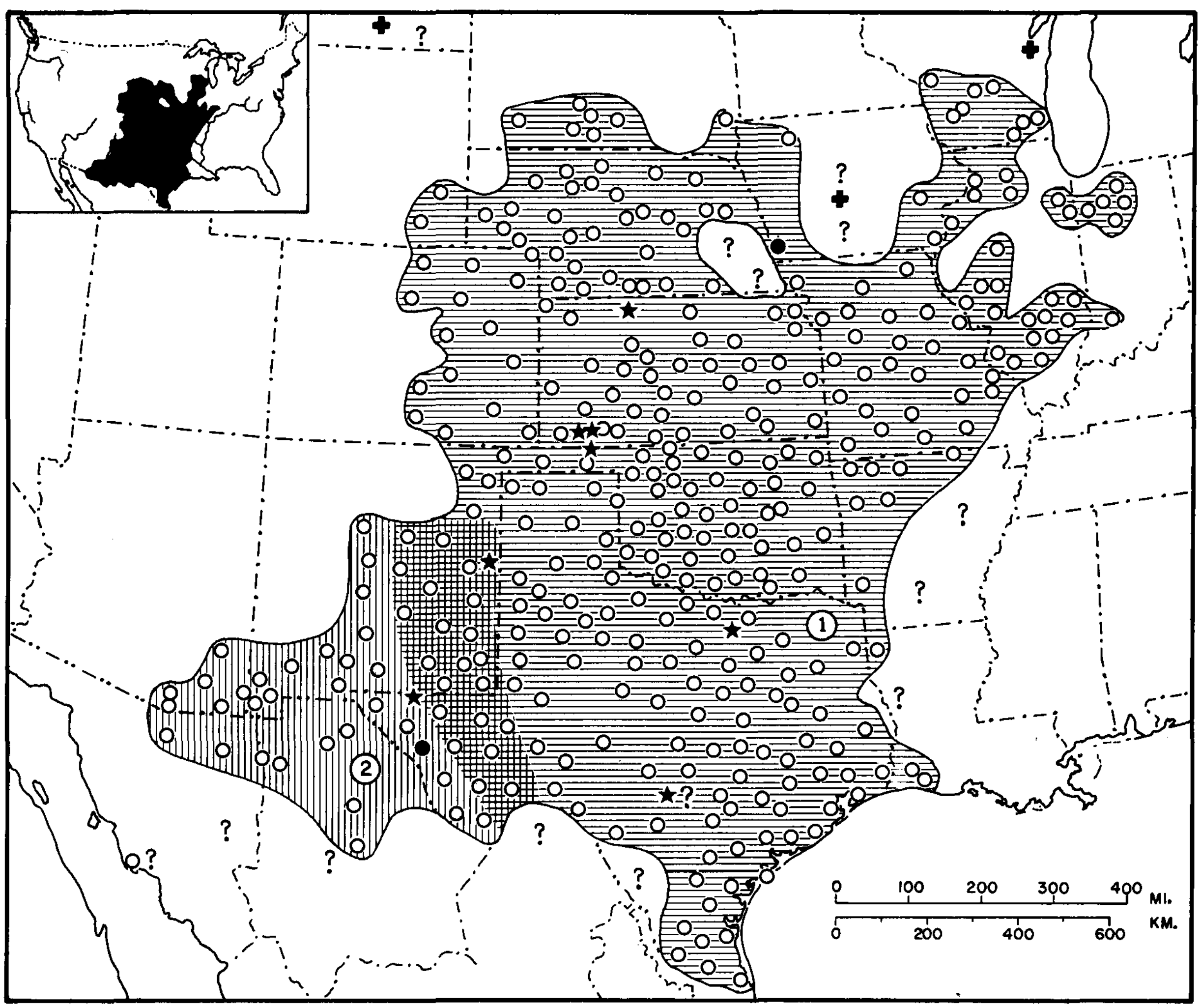
Cistudo ornata Agassiz, 1857:445. Type-locality, "from the Upper Missouri . . . and from Iowa"; restricted to "Council Bluffs [Pottawattamie Co.], Iowa," by Smith and Taylor (1950:36). Syntypes: adult female, U.S. Nat. Mus. 57 (= 7862), Yellowstone, collected by F. V. Hayden, no date; adult male, USNM 7541, and juvenile, USNM 131837, southern boundary Kansas, collected by [W. S.] Wood and [J. H.] Clark, no date; adult male, USNM 7542, Illinois, collected by [R. W.] Kennicott, no date; adult male, USNM 7547, Republican River, collected by [W. S.] Wood, no date; adult male, USNM 7692, Republican River, Kansas, collected by W. S. Wood, 1857; adult female, Mus. Comp. Zool., Harvard Univ., 1536, Burlington [Des Moines Co.], Iowa, collected by [J.] Rauch, 1857. All syntypes seen by author. See COMMENT.

Terrapene ornata: Baur, 1891:191. First use of combination.

• CONTENT. Two subspecies are recognized; *Terrapene ornata ornata* and *T. o. luteola*.

• DEFINITION. Adults are 95–154 mm in carapace length; females are usually larger than males. The carapace is round to oval in outline and flattened dorsally, highest at or anterior to the hinge. A middorsal keel is absent or poorly developed. The plastron is hinged at the pectoral-abdominal seam and can entirely close the shell when retracted. The lateral plastral margin is usually entire; the posterior margin is straight across the anal scutes. The carapace is brown to black with yellow streaks radiating from the posterodorsal corner of each pleural scute. Other carapacial and plastral scutes are similarly streaked with yellow. A middorsal yellow line, usually continuous, is formed by streaks on adjacent vertebral scutes. In hatchlings and juveniles, the radiating yellow streaks are less developed on the carapace except for those of the middorsal line, and the plastron is solid brown with a yellow periphery. The skin is brown with yellow spots and mottling on the head and legs; some males have an entirely green head. The interhumeral seam is short, 10 to 19% of the anterior plastral lobe length, and the interfemoral seam is long, 16 to 24% of the posterior lobe length. Maximum combined width of both gular scutes is equal to or less than the length of the intergular seam. The skull lacks a postorbital bar, and the posterior border of the postorbital bone is smooth. The lateral border of each peripheral bone bears a small denticulate process at the epidermal scute seam. Males usually have red irises (females yellow); elongate, thick tails, with the vent beyond the carapace margin; slightly concave plastrons; and enlarged inner toes on each hindfoot which can be turned inward at sharp angles.

• DESCRIPTIONS. Ditmars (1934), Cahn (1937), Carr (1952), Legler (1960), Smith (1961), Milstead (1969), Ernst and Barbour (1972), and Conant (1975) provide general descriptions. Juveniles and hatchlings are described in Marr (1944), Carr (1952), Legler



MAP. Solid circles mark type-localities, open circles indicate other localities. Stars indicate fossil sites. Crosses mark areas of apparently recent extinction. Question marks indicate uncertain range limits or localities.

(1960), Smith (1961), and Anderson (1965); eggs in Carr (1952), Legler (1960), and Anderson (1965). Legler (1960) gives a general anatomical summary. More detailed descriptions are: choanae, Parsons (1960); ear, Baird (1970); pelvic girdle/hindlimb, Zug (1971); penis, Zug (1966); rostral pore, Winokur and Legler (1974); shell, Tinkle (1962), Bramble (1974); vertebrae, Williams (1950).

• ILLUSTRATIONS. A drawing of an adult is in Stebbins (1954); choanae, Parsons (1960); hatchling, Agassiz (1857), Legler (1960); scutes and shell, Legler (1960); skull, Baur (1891), Taylor (1894), Cahn (1937), Legler (1960), Ernst and Barbour (1972); color photo, Schmidt and Inger (1957), Ernst and Barbour (1972), Conant (1975); black and white photo, Ditmars (1934), Cahn (1937), Carr (1952), Smith and Ramsey (1952), Legler (1960), Milstead (1969), and Ernst and Barbour (1972).

• DISTRIBUTION. *Terrapene ornata* occurs in the grasslands of the Great Plains of North America, ranging from southern Wisconsin to southeastern Wyoming, southward to the Gulf Coast of western Louisiana and Texas, and westward to southern Arizona and northeastern Sonora. *T. ornata* occurs up to 2,000 m (Stebbins, 1954; Degenhardt and Christiansen, 1974). The northern edge of the range appears to be constricting, since previously reported populations in the north are extinct. Habitat alteration due to modern agriculture may be responsible.

Records from Montana (Brunson, 1955; Black and Black, 1971) and Guaymas, Mexico (Milstead, 1967) may derive from releases; the existence of viable populations requires corroboration. The Montana record is based on a syntype (USNM 57). The Wisconsin record (Hay, 1883; Adler, 1968) represents one of several extant populations in that state (Dickinson, 1965). *T. ornata* is well established in two areas of Indiana (Evermann and Clarke, 1930; Grant, 1936; List, 1951; Minton, 1972) and of Louisiana (Rossman, 1965; Blaney, 1968).

• FOSSIL RECORD. *Terrapene ornata* is known from the Pleistocene: Clear Creek (Sangamon), Denton Co., Texas (Holman, 1963, 1969); Clovis (Wisconsin and post-Wisconsin), New Mexico (Milstead, 1967); Arkalon (Kansan), Seward Co., Kansas (Preston, 1971). A sub-Recent record is from Pratt Cave, Culberson Co., Texas (Gehlbach and Holman, 1974). A *Terrapene* from Saw Rock Canyon (Pliocene: Blancan), Seward Co., Kansas, discovered by Hibbard (1964), was not identified to species but may be a *T. ornata*. The extinct *Terrapene longinsulae* of Long Island (Middle Pliocene), Phillips Co., Kansas, is considered to be a subspecies of *T. ornata* (Milstead, 1967). Additional fragments and shells have been identified as *longinsulae* (Milstead, 1969) from the Ballard Formation (Aftonian), Meade Co., Kansas (Hibbard, 1958) and from the Ogallala Formation (late Middle Pliocene), Beaver Co., Oklahoma (Hibbard, 1954). Hay (1921) identified fragments from the Friesenhahn Cave (Pleistocene: Wisconsin), Bexar Co., Texas, as *Terrapene whitneyi*, which Milstead (1956) found to be indistinguishable from *T. canaliculata* but suggested that *whitneyi* may be part of the *ornata* group. Moodie and Van Devender (1978), in a paper received too late to include the record on the distribution map, record a Pliocene *Terrapene* "that may be close to *T. ornata*" as well as Pleistocene *T. ornata* from southeastern Arizona.

• PERTINENT LITERATURE. Aspects of the biology of *T. ornata* are reviewed in Carr (1952), Stebbins (1954, 1966), Legler (1960), Ernst and Barbour (1972), and Conant (1975). Other pertinent references are listed by topic. Behavior: Rodeck (1949), Clarke (1950), Norris and Zweifel (1950), Rosenbaum (1968), Ashe (1970), Metcalf and Metcalf (1970), Harless and Lambiotte (1971). Cloacal bursae: Smith and James (1958). Dispersal: Grant (1935), Schmidt (1938), Smith and Buechner (1947), Auffenberg and Milstead (1965), Adler (1968), Milstead (1969). Ecology: Gloyd (1937), Lewis (1950), Peterson (1950), Brumwell (1951), Fouquette and Lindsay (1955), Clarke (1958), Minton (1959), Legler (1960), Axtell and Webb (1963), Timken (1969). Feeding: Norris and Zweifel (1950), Fitch (1965), Skorepa (1966), Metcalf and Metcalf (1970), Kramer (1973). Growth: Wunder et al. (1962). Hibernation: Cahn (1933), Clarke (1956), Peters (1959). Movements: Fitch (1958), Milstead (1961), Metcalf and Metcalf (1970). Parasites: Rainey (1953). Physiology: Peters (1959), Roddie (1962), Dodge and Folk (1963), Baze and Horne (1970), Legler (1971), Gatten (1974, 1975). Reproduction: Brumwell (1940), Legler (1956, 1958), Bissett (1968). Rostral pores: Winokur and Legler (1974). Serology: Leone and Wilson (1961), Dessauer (1970). Shell volume: Patterson (1973). Skull morphology: Ruckes (1937), Zangerl (1948). Taxonomy: Taylor (1894), Cope (1895), Ditmars (1934), Milstead and Tinkle (1967), Milstead (1967, 1969). Temperature relationships: Fitch (1956), Brattstrom (1965), Rose (1969), Riedesel et al. (1971), Bethea (1972), Spray (1972), Gatten (1974), Sturbaum and Riedesel (1972, 1974, 1977). Chromosomes: Killebrew (1977).

• ETYMOLOGY. The name *ornata* is from the Latin *ornatus* for ornamented or flowery in reference to the radiated pattern on the carapacial scutes. *Luteola* is from the Latin *luteolus*, yellowish (dimin. of *luteus*, yellow), and refers to the solid yellow or horn-colored carapace of the holotype.

1. *Terrapene ornata ornata* (Agassiz)

Cistudo ornata Agassiz, 1857:445. See species account.
Terrapene ornata var. *cimarronensis* Cragin, 1894:37. Type-locality, "the 'Red beds' country of the Cimarron Basin" (See REMARKS.)
Terrapene ornata ornata: Smith and Ramsey, 1952:45.

• DEFINITION. The second pleural scute has five to nine yellow streaks. The length of the anterior lobe of the plastron is 66–70% of the length of the posterior lobe. The gular and pectoral lengths are 50–59 and 26–35%, respectively, of the anterior plastral lobe length. The ground color of the carapace is dark (brown to black).

• REMARKS. Cragin (1894) failed to designate a holotype of *T. o. cimarronensis* which he termed "merely a color variety of *T. ornata*," but noted it was common in western Kansas and Oklahoma. Webb (1970) suggested that the "Red beds" country might be in Oklahoma.

2. *Terrapene ornata luteola* Smith and Ramsey

Terrapene ornata luteola Smith and Ramsey, 1952:45. Type-locality, "17 miles south of Van Horn, Culberson County, Texas." Holotype, adult male, Texas Christian University 1280, collected 22–24 October 1950 by W. E. Smith (not seen by author).

• DEFINITION. There are 10 to 16 yellow streaks on the second pleural scute. The length of the anterior lobe of the plastron is 69–72% of the length of the posterior lobe. The gular and the pectoral scute lengths are 46–55 and 32–36% respectively, of the anterior lobe length. The carapacial ground color is lighter than that of *ornata*. There is a tendency for the shell of older individuals to become uniformly straw-colored or horn-colored.

• REMARKS. Legler (1960) indicated a zone of intergradation in eastern New Mexico and southwestern Texas; Degenhardt and Christiansen (1974) seemed to concur with their map of New Mexico. However, Milstead (1969) recognized intergrades in northeastern Colorado and near the southern Texas Gulf Coast (specimens from other parts of Texas—such as USNM 52, San Antonio—support Milstead). The map published here reflects the zone of intergradation indicated by Legler (1960). I regard the separation of *ornata* into subspecies as questionable.

COMMENT

The status of the syntypes is confused. Agassiz (1857) did not list museum numbers or specific localities of the syntypes. Several discrepancies exist in the data for the syntypes in the National Museum of Natural History (USNM). The original specimen tags and the catalogue entries do not reflect the same information, nor that on retagged specimens, nor that information in Cochran (1961). The original catalogue entries list four specimens each for USNM 7541 and 7542, but only two specimens of the original 7541 entry and one of 7542 can be found. USNM 131837 was recatalogued from 7541, but the locality data were erroneously transcribed from 7542. The locality "Illinois" is given for 7542, whereas Agassiz's type-locality statement for the USNM specimens mentions only the Upper Missouri. Taylor (1894) lists the locality of 7541 as Sand Hills, Nebraska, while the tag shows "S . . . Kansas . . . Hills." Yarrow (1882) records the locality of 7547 as "Republican River, Nebr." The locality recorded for USNM 57 (Yellowstone) is suspect. Quite likely this refers to the shipping point for the specimen rather than the location of collection (Cochran, 1961).

Specimens with characters of both *T. carolina* and *T. ornata* have been found. Whether the aberrant individuals are hybrids remains debatable (Clark, 1935; Shannon and Smith, 1949; Mertens, 1950, 1956; Smith, 1955; Milstead and Tinkle, 1967). Recent alteration of habitat in the area of sympatry may have permitted the contact of previously isolated populations and a breakdown of reproductive barriers (Blaney, 1968; Ward, 1968).

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